

## What is Claimed is:

- [c1] Apparatus for performing parallel tests (of logic and memory) for semiconductor devices having logic and memory macro with BIST circuits, comprising:
  - voltage isolation elements for logic and memory circuits;
  - a clocking system including clocking isolation elements for logic and memory circuits;
  - scan chain by pass isolation elements;
  - to enable and disable the BIST whereby the testing of the memory macro circuits is performed while the logic scan chain results are read out.
- [c2] The apparatus of claim 1 wherein the bypass isolation elements are initiated by a control signal.
- [c3] The apparatus of claim 2 wherein the control signal is provided by a primary input from control circuit.
- [c4] The apparatus of claim 2 wherein the control signal is provided by a latch.
- [c5] The apparatus of claim 2 wherein the control signal is applied to a latch.
- [c6] The apparatus of claim 5 wherein the latch provides the control signal to a multiplexer in each memory macro.
- [c7] The apparatus of claim 6 wherein the control signal places the apparatus into bypass mode by selecting a scan in signal which loads logic test patterns into the BIST circuits.
- [c8] The apparatus of claim 7 wherein after the BIST is completed the apparatus is taken out of bypass mode and the results are unloaded.
- [c9] The apparatus of claim 6 wherein the clocking system includes a memory test lock which allows a logic test pattern to be loaded and unloaded independent of the memory clock.
- [c10] The apparatus of claim 9 wherein a signal to the clocking system is applied by an external tester to a clock multiplier and control circuit.

- [c11] The apparatus of claim 9 wherein a signal to the clocking system is applied by an external tester to a clock generator located on the semiconductor device.
- [c12] A method for performing parallel tests of logic and memory on a semiconductor device having logic with BIST and memory circuits comprising:
- separating the logic and memory circuits using isolation elements;
  - clocking the logic and memory circuits;
  - enabling and disabling the BIST scan chain bypass isolation elements; and
  - testing the memory circuits while the logic scan chain results are read out.
- [c13] The method of claim 12 including testing the bypass isolation elements by a control bypass signal.
- [c14] A method for performing parallel tests of logic and memory macro on a semiconductor device having logic with BIST and memory circuits comprising:
- verifying scan chain and BIST operation;
  - loading BIST patterns using global clocking;
  - placing the device into a bypass mode wherein the memory macro circuits are isolated from the scan chains;
  - generating separate test clock signals to both memory macro circuits and logic circuits; and
  - running the scan chains in parallel with BIST.